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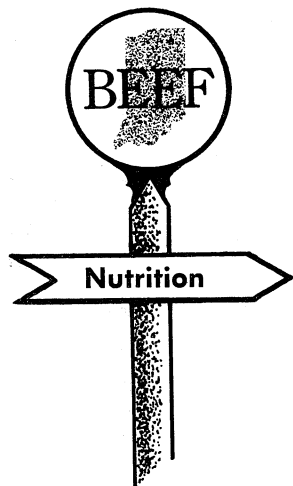
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Stilbestrol for Cattle

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Introduction

For more than 30 years, the importance of natural hormones that are secreted by the body has been recognized. In 1937 two British chemists, Dodds and Lawson, first synthesized diethylstilbestrol.

The use of stilbestrol in beef cattle rations is one of the most significant developments in beef cattle feeding. The primary effects of its use which are increased rate of gain and improved feed efficiency, have been of benefit to many cattle feeders. Stilbestrol has often made the difference between profit and loss for cattle feeding operations.

What is diethylstilbestrol?

Diethylstilbestrol (DES) does not occur in nature. It is a synthetic chemical compound having many of the effects of natural female sex hormones which are secreted by the ovary. Stilbestrol has an advantage because it is effective in animals no matter whether administered in the feed, implanted as a solid pellet beneath the skin, or injected in solution.

The first trials showing the growth stimulating effects of diethylstilbestrol in beef cattle were conducted at Purdue University in 1947 with Hereford heifers implanted with 42 milligrams of stilbestrol. Since this early work, many trials have been conducted to study the effects of female hormones in

steers, heifers and bulls. The experimental levels of implanted stilbestrol have ranged from 6 to 120 milligrams, with the most satisfactory results obtained with 24 to 36 milligrams. Daily oral treatment of 10 milligrams per animal has compared favorably with implantation.

Most experiments showed that stilbestrol produced both growth effects and estrogenic effects. The growth effects manifested themselves in increased rate of gain and improved feed efficiency. The estrogenic effects are raised tailheads, depressed loins, mammary development, swelling of the vulva, and on occasion prolapses of the vagina or uterus. In all the trials conducted to date, stilbestrol produces some estrogenic effects, in addition to growth response.

The most serious of these estrogenic effects is the vaginal or uterine prolapse, which may force the feeder to sell the animal before she is finished, or in the very serious cases may result in the loss of the heifer. The extent to which heifers show estrogenic effects is influenced by many factors. Two of the most important factors are (1) the amount of hormone present in the blood stream of the individual animal and (2) the reaction of each heifer to the hormone.

Implantation of stilbestrol

This technique involves implanting small pellets of stilbestrol in the loose skin near

the base of the ear. Purdue experiments with beef heifers beginning in 1947 and with beef steers in 1950 showed that rate of gain increased and feed efficiency improved with the implantation of pellets of diethylstilbestrol. Continued research in trials at Purdue and other experiment stations led to the acceptance of this method in 1955. In early experiments, such large amounts were used that many undesirable side effects were noted. Later, research proved that smaller dosages were as satisfactory as large doses of stilbestrol. Under practical feedlot conditions, many heifers have been fed or implanted with stilbestrol without any undesirable effects. It should be emphasized, however, that heifers and steers are different in their responses and that cattle feeders should know about the vaginal prolapse problem.

Rate of gain increase (10-25%) and the improvement in feed efficiency (5-15%) is about the same on implanted cattle as on those fed stilbestrol. Research has shown that a single implantation is normally effective for four to five months and may be effective up to seven or eight months. A second implantation at the end of this time may produce additional gain. Cattle probably should not be re-implanted at the end of a 7 or 8 month period if they are to be marketed within 100-120 days. Rather than implant at this time, feed stilbestrol for this 100-120 day period. If the cattle are not to be marketed for at least five months, they may be implanted again with little danger. The recommended levels of implants is 24 milligrams for heifers and 36 milligrams for steers.

Implants in nursing calves

Over the last few years, the implanting of nursing beef calves with stilbestrol has been on the increase. Reports from Oklahoma show generally favorable results from the implanting of stilbestrol in very young calves. Two trials conducted by Purdue researchers produced mixed results. The first trial in 1959 resulted in significantly greater gains

for calves implanted with stilbestrol. The implanted steer calves also gained significantly more than did the implanted heifers. The 1960 results, however, did not produce significant differences in gain, and the steer calves did not gain significantly any more than did the heifer calves.

In both trials the calves were approximately 3 months old when they were implanted with a 12 milligram pellet and re-implanted 2 to 2.5 months later with an additional 12 milligram pellet. The side effects usually associated with the use of stilbestrol were evident in both trials.

Advantages

Implants have some advantages over the oral feeding of stilbestrol. They cost less than feeding stilbestrol. A 36 milligram implant costs about 35 cents. The stilbestrol in feed, 10 milligrams per day for a 150-day feeding period, would cost approximately 60 cents. Also lower cost supplements can be used when the cattle are implanted because stilbestrol in feed can be obtained only in commercially mixed supplements. The feeder can select certain animals in a lot to be implanted and others that are to be kept for breeding purposes need not receive the implant.

Disadvantages

Along with the advantages of implanting, there are some disadvantages. The use of implants for heifers is questionable. If the cattle have been implanted within a 4 to 6 month period prior to the time the feeder purchased them and he has no knowledge of this, a second implant may bring about serious side effects. The cattle must be restrained when the implanting is done. This requires that the feeder have the necessary facilities for catching and holding the animal.

Stilbestrol in the feed

Research at the Iowa Experiment Station reported in 1954 that daily gains and feed efficiency were improved when 10 milligrams of stilbestrol per head were added to the daily ration of fattening steers. The addition of stilbestrol to drylot rations of steers generally increased daily gain 10-25% and improved feed efficiency by 5-15% with only very little, if any, increase in feed consumption. Research trials have shown that steers will be 50 pounds or more heavier at time of marketing on the same amount of feed if stilbestrol is included in the ration; therefore, an additional steer for every 20 in the lot.

Age and weight

Age and weight have an effect on the response that can be expected from the use of stilbestrol. Older, heavier animals seem to respond better than younger, lighter animals.

Level to feed

The recommended level of stilbestrol to feed is 10 milligrams per head daily. This is not a case where a little is good, but a lot is better. Ten milligrams per head daily is the highest amount that should be fed and no more. The stilbestrol content of a supplement may be listed on the feed tag in milligrams per pound or as a percent. Five milligrams per pound of supplement is .0011 percent and 10 milligrams per pound is .0022 percent.

Type or ration

The best results from stilbestrol are obtained on high-grain rations. A somewhat lower response is the result when the cattle are on a high-roughage ration. Animals on wintering rations of forage will have an increased gain of 0.1 to 0.15 pounds per day

when stilbestrol is fed. When grain rations are used, daily gain increases 0.2 to 0.3 pounds with stilbestrol.

Length of feeding period

Increased gain and efficiency can be expected from stilbestrol when it is included in the ration, regardless of the length of the feeding period.

Effect on carcass grade and shrink

Carcass grades of stilbestrol-fed steers will be the same or slightly lower than steers not receiving stilbestrol. Stilbestrol stimulates the growth but does not increase fat deposition. Therefore, even though cattle receiving stilbestrol are heavier at market, they usually have the same or even lower percentage of trim, excess fat.

Stilbestrol apparently has no undesirable effect on dressing percent, shrink, carcass conformation, or palatability of the meat, if used at recommended levels.

Side effects

Side effects, such as higher tailheads, depressed loins, and increased mammary development, are generally observed in some cattle when they receive stilbestrol in their rations. This may be of little practical importance in cattle being fed to a choice grade. But if cattle are to be fed to a prime grade or for a speciality market, these side effects may then be of practical importance.

Effect stilbestrol may have on hogs following cattle

Any harmful effects stilbestrol may have on breeding swine will depend on how much feed they receive in addition to what they

glean from the manure. In an Iowa test, open sows that were following cattle receiving stilbestrol were fed 7 pounds of feed daily in addition to what they got from the manure. These sows conceived and farrowed normal litters. However, in an Illinois test, open sows that had to get almost all of their feed from the manure of stilbestrol-fed steers, did not conceive normally. Bred sows that were in the same lot farrowed normal litters. To be on the safe side, breeding sows or gilts should not follow the cattle that are receiving stilbestrol in their rations.

Breeding cattle should not be fed rations that contain stilbestrol.

Food and Drug Administration regulations

The FDA considers diethylstilbestrol a drug. It is a drug that can be mixed in a supplement only after the mixer receives an approved new drug application (NDA) from FDA. Because of this requirement, most cattle feeders buy a commercial supplement containing stilbestrol, or they administer stilbestrol as an implant.

Feeds containing stilbestrol cannot be legally fed within the 48 hour period immediately preceding slaughter. This 48 hour withdrawal period is sufficient to rid the tissues of illegal stilbestrol residues. Violation of this regulation may result in harmful residues in the meat and seizure of carcasses by federal authorities.